

Danilo and Popow having recently described certain changes in the appearance of the motor cells of the spinal cord in rabbits and dogs after poisoning with arsenic and phosphorus, F. Kreyssig has repeated the experiments under F. Schultze's direction, and observed the results (*Virchow's Archiv*, Bd. 102). In preparation for the investigation the normal appearances in the cords of these animals were examined, and certain important facts were elicited, which may have a wider application than the author suspects. He found that after hardening in Müller's fluid or any chromic-acid solution the cells of the normal cords presented great varieties of appearance, and of power of absorbing coloring matter. Some cells were colored dark and surrounded by a pericellular space; others were pale and were not so surrounded. Vacuoles were found in the cells, large cells without processes, whose body was apparently deficient in protoplasm were observed, especially in young animals. All these changes which were ascribed by the earlier investigators to effects of the poisons were therefore present in normal cords. It was found, however, that these appearances were more evident in cords which had been transferred from Müller's fluid to 96 % alcohol than those which had been placed in 10 % alcohol and then in solutions of alcohol of increasing strength till the strong solution was reached. The appearances were consequently ascribed to the effects of the strong alcohol upon the cords hardened in the chromate salts. When the proper precautions were taken with the cords of animals poisoned with arsenic and phosphorus no such appearances were found as had been described by Danilo, capillary hemorrhages being the only lesion produced by the poison.

It is not at all impossible that the same precautions would be advisable in hardening human cords, since the appearances found resemble those often observed in human cords hardened in the usual manner.

M. A. STARR.

PHYSIOLOGY (INCLUDING EXPERIMENTAL PHYSIOLOGY) OF
THE NERVOUS SYSTEM.

The Relation Between the Temperature Changes in the External Auditory Canal and the Circulation of the Brain. *Pflüger's Archiv*, Bd. 38, Heft 3 and 4.

Dr. Istamanoff has made a series of experiments upon the subject. The observations of Dr. Mendel have demonstrated that the temperature in the external auditory canal is about 2° lower than that of the axilla. If now we compare this statement with the results of Dr. Wassiljeff, that the temperature of the external auditory canal gives the temperature of the brain, then it may be assumed that the temperature of the brain is lower or similar to the temperature in the axilla, which is opposed to facts stated by Drs. Heidenheim and Körner, that the brain is the warmest organ in the organism. He went over Dr. Wassiljeff's experiments and found that under the influence of hot applications to the hand of

about $+35^{\circ}$ and lower, the temperature rose in the external auditory canal; whilst under the influence of $+8^{\circ}$ and lower, the temperature fell in the external auditory canal. Hence the conclusion that under the influence of cold applications to the hand the determination of blood to the brain is diminished, and under the influence of warm applications to the hand it is increased. In a boy who had a defect in his frontal bone he studied the changes of volume in the brain in relation to the temperature of the external ear. For this purpose the changes in the volume of the brain were estimated, and simultaneously the temperature in the external auditory canal was measured. The experiment showed that under the influence of cold applications the volume of the brain increased, and at the same time the temperature in the external auditory canal fell, an opposite result ensued by warm applications. From these experiments it follows that the external auditory canal behaves towards thermic irritations as the peripheral parts of the body, and that the temperature of the peripheral parts by the irritation stands in antagonistic relation to the vessels of the brain.

ISAAC OTT.

On the Modification of the Circulation of the Blood in the Brain During Chloroform Narcosis, Accompanied with Painful Excitation. By Drs. ANTONIO CARLE and GUISEPPE MUSSO. *Rivista Clinica, Gennaio, 1880.*

The following conclusions were deduced in the investigation of Drs. Carle and Musso on this subject:

1. Under the influence of the inhalations of chloroform there was a progressive diminution of the tonicity of the vessels of the brain. The circulation of this organ is slowed and there is produced a venous congestion.

2. In the period of complete narcosis and persistent anæsthesia the diminished tonicity of the vessels of the brain and the slowing of the circulation of the blood of this organ, which was initiated during the inhalation, there exists in the place of the above-mentioned congestion in the brain, an arterial anæmia.

3. This last condition of the cerebral circulation is not modified in an appreciable manner with the return of consciousness and sensibility of the individual, whence follows that this is not enough to explain the anæsthetic action of chloroform, and therefore the hypothesis is strengthened that chloroform anæsthesia may be due to a direct action of the chloroform on the nerve centres.

4. Chloroform anæsthesia does not withdraw entirely the nerve centres from the action of the strong peripheric irritation which increases in a transitory manner the tonicity of the vessels of the brain, and increases the circulation of this organ.

GRACE PECKHAM.

Physiological Studies of the Knee-Jerk, and of the Reactions of Muscles under Mechanical and other Ex-